

It is claimed:

1 1. A local oscillator (LO) circuit, comprising:
2 a first LO source to generate a first periodic signal cycling at a first frequency;
3 a second LO source to generate a second periodic signal cycling at a second
4 frequency different than said first frequency;
5 a limiter;
6 a first switching element to selectively couple said first LO source to said limiter;
7 and
8 a second switching element to selectively couple said second LO source to said
9 limiter.

1 2. The LO circuit of claim 1, wherein said first and/or second switching
2 element comprises a transistor.

1 3. The LO circuit of claim 2, wherein said transistor comprises a field effect
2 transistor.

1 4. The LO circuit of claim 1, further comprising a transformer coupled
2 between said limiter and said first and second switching elements, wherein said
3 transformer comprises first and second differential transformer outputs.

1 5. The LO circuit of claim 4, wherein said limiter comprises:
2 a first differential transistor having a first conduction path and a first control input
3 to control a resistance of said first conduction path, wherein said first control input is
4 coupled to said first differential transformer output;
5 a second differential transistor having a second conduction path and a second
6 control input to control a resistance of said second conduction path, wherein said second
7 control input is coupled to said second differential transformer output;
8 a first resistive element coupled between said first conduction path and a power
9 supply terminal;

10 a second resistive element coupled between said second conduction path and said
11 power supply terminal; and

12 a current source coupled between said first and second conduction paths and a
13 ground terminal.

1 6. The LO circuit of claim 5, wherein said first and/or second differential
2 transistors comprises a bipolar transistor.

1 7. The LO circuit of claim 5, wherein said first and/or second resistive
2 elements comprises a resistor.

1 8. A method comprising:
2 generating a first LO signal cycling at a first frequency;
3 generating a second LO signal cycling at a second frequency different than said
4 first frequency;
5 activating a first switching element to substantially produce said first LO signal at
6 a node;
7 de-activating a second switching element to substantially de-couple said second
8 LO signal from said node, wherein a leakage LO signal is also produced at said node; and
9 amplifying said first LO signal and said leakage LO signal at said node, wherein a
10 gain associated with said first LO signal is greater than a gain associated with said
11 leakage LO signal.

1 9. The method of claim 8, wherein amplifying said first LO signal and said
2 leakage LO signal is performed by a limiter.

1 10. A receiver comprising:
2 a mixer to down convert a received RF signal to an intermediate frequency (IF)
3 signal; and
4 a local oscillator (LO) circuit coupled to said mixer, wherein said LO circuit
5 comprises:

6 a first LO source to generate a first periodic signal cycling at a first
7 frequency;
8 a second LO source to generate a second periodic signal cycling at a
9 second frequency different than said first frequency;
10 a limiter;
11 a first switching element to selectively couple said first LO source to said
12 limiter; and
13 a second switching element to selectively couple said second LO source to
14 said limiter.

1 11. The receiver of claim 10, further comprising a transformer coupled
2 between said limiter and said first and second switching elements, wherein said
3 transformer comprises first and second differential transformer outputs.

1 12. The receiver of claim 11, wherein said limiter comprises:
2 a first differential transistor having a first conduction path and a first control input
3 to control a resistance of said first conduction path, wherein said first control input is
4 coupled to said first differential transformer output;
5 a second differential transistor having a second conduction path and a second
6 control input to control a resistance of said second conduction path, wherein said second
7 control input is coupled to said second differential transformer output;
8 a first resistive element coupled between said first conduction path and a power
9 supply terminal;
10 a second resistive element coupled between said second conduction path and said
11 power supply terminal; and
12 a current source coupled between said first and second conduction paths and a
13 ground terminal.

1 13. The receiver of claim 10, further comprising a low noise amplifier (LNA)
2 to amplify said received RF signal, wherein an output of said LNA is coupled to an input
3 of said mixer.

1 14. The receiver of claim 10, further comprising an image reject filter to reject
2 an image signal present in said received RF signal, wherein said image reject filter is
3 coupled to an input of said mixer.

1 15. The receiver of claim 10, further comprising an IF filter to remove
2 undesired signals from said IF signal.

1 16. The receiver of claim 10, further comprising an IF amplifier to amplify
2 said IF signal.

1 17. A transmitter comprising:
2 a mixer to up convert an intermediate frequency (IF) signal to a radio frequency
3 (RF) signal; and
4 a local oscillator (LO) circuit coupled to said mixer, wherein said LO circuit
5 comprises:
6 a first LO source to generate a first periodic signal cycling at a first
7 frequency;
8 a second LO source to generate a second periodic signal cycling at a
9 second frequency different than said first frequency;
10 a limiter;
11 a first switching element to selectively couple said first LO source to said
12 limiter; and
13 a second switching element to selectively couple said second LO source to
14 said limiter.

1 18. The transmitter of claim 17, further comprising a transformer coupled
2 between said limiter and said first and second switching elements, wherein said
3 transformer comprises first and second differential transformer outputs.

1 19. The transmitter of claim 18, wherein said limiter comprises:

2 a first differential transistor having a first conduction path and a first control input
3 to control a resistance of said first conduction path, wherein said first control input is
4 coupled to said first differential transformer output;

5 a second differential transistor having a second conduction path and a second
6 control input to control a resistance of said second conduction path, wherein said second
7 control input is coupled to said second differential transformer output;

8 a first resistive element coupled between said first conduction path and a power
9 supply terminal;

10 a second resistive element coupled between said second conduction path and said
11 power supply terminal; and

12 a current source coupled between said first and second conduction paths and a
13 ground terminal.

1 20. The transmitter of claim 17, further comprising a power amplifier to
2 amplify said RF signal, wherein an input of said power amplifier is coupled to an output
3 of said mixer.

1 21. The transmitter of claim 17, further comprising an image reject filter to
2 reject an image signal present in said IF signal, wherein said image reject filter is coupled
3 to an input of said mixer.

1 22. The transmitter of claim 17, further comprising an RF filter to remove
2 undesired signals from said RF signal.

1 23. The transmitter of claim 17, further comprising an IF amplifier to amplify
2 said IF signal.

1 24. An apparatus, comprising
2 a mixer including a local oscillator (LO) input; and
3 a limiter having an output coupled to said LO input of said mixer.